

① You invest \$5000 at 6.5% APR compounded monthly

(a) write a function for this situation.

(b) Find the time for your investment to double.

(c) Find the rate that will double your money in 8 years.

(d) What amount would you have to start with to get \$10,000 in 5 years at 6.5% APR compounded monthly.

② Solve for x

(a)  $\ln(x-2) = 2$

$$\downarrow$$

$$\log_e(x-2) = 2$$

$$\rightarrow e^2 = x-2$$

$$e^2 + 2 = x$$

$$\boxed{x \approx 9.389}$$

(b)  $\log 2x + \log x = 3$

$$\rightarrow \log(2x \cdot x) = 3$$

$$\log_{10}(2x^2) = 3$$

$$\rightarrow 10^3 = 2x^2$$

$$\frac{1000}{2} = \frac{2x^2}{2}$$

$$500 = x^2$$

$$\sqrt{\quad} \quad \sqrt{\quad}$$

$$\boxed{x \approx 22.361}$$

8.5 #45

$$\log 5 - \log 2x = 1$$

$$\log_{10}\left(\frac{5}{2x}\right) = 1$$

$$\rightarrow 2x 10^1 = \frac{5}{\cancel{2x}}$$

$$\frac{20x}{20} = \frac{5}{20}$$

$$x = \frac{1}{4}$$

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# 8-11, 22, 32, 34, 44, 46, 49, 50, 55, 62, 63, 67-72

$$\textcircled{1} \textcircled{a} \quad y = 5000 \left(1 + \frac{0.065}{12}\right)^{12x}$$

$$\frac{10000}{5000} = \frac{5000 \left(1 + \frac{0.065}{12}\right)^{12x}}{5000}$$

$$2 = (1.0054)^{12x}$$

$$12x = \frac{\log 2}{\log 1.0054}$$

$$12x = 128.707 \text{ months}$$

$$x = 10.73 \text{ years}$$

$$y = 5000 \left(1 + \frac{r}{12}\right)^{12 \cdot 8}$$

$$\frac{10,000}{5000} = \frac{5000}{5000} \left(1 + \frac{r}{12}\right)^{96}$$

$$2 = \left(1 + \frac{r}{12}\right)^{96}$$

$$\sqrt[96]{\phantom{x}} \quad \sqrt[96]{\phantom{x}}$$

$$\frac{1.00725}{-1} = \frac{1 + \frac{r}{12}}{-1}$$

$$12 \cdot 0.00725 = \frac{r}{12} \cdot 12$$

$$r = 0.08696 \approx \boxed{8.7\%}$$

$$10,000 = X \left( 1 + \frac{0.065}{12} \right)^{12 \cdot 5}$$

$$10,000 = X \left( 1 + \frac{0.065}{12} \right)^{60}$$

↓

$$\frac{10,000}{1.3828} = X \cdot \frac{1.3828}{1.3828}$$

$$\boxed{X = \$7231.70}$$